Functional and mechanistic studies of XPC DNA-repair complex as transcriptional coactivator in embryonic stem cells.

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Public Summary:
The embryonic stem cell (ESC) state is transcriptionally controlled by OCT4, SOX2, and NANOG with cofactors, chromatin regulators, noncoding RNAs, and other effectors of signaling pathways. Uncovering components of these regulatory circuits and their interplay provides the knowledge base to deploy ESCs and induced pluripotent stem cells. We recently identified the DNA-repair complex xeroderma pigmentosum C (XPC)-RAD23B-CETN2 as a stem cell coactivator (SCC) required for OCT4/SOX2 transcriptional activation. Here we investigate the role of SCC genome-wide in murine ESCs by mapping regions bound by RAD23B and analyzing transcriptional profiles of SCC-depleted ESCs. We establish OCT4 and SOX2 as the primary transcription factors recruiting SCC to regulatory regions of pluripotency genes and identify the XPC subunit as essential for interaction with the two proteins. The present study reveals new mechanistic and functional aspects of SCC transcriptional activity, and thus underscores the diversified functions of this regulatory comple

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